Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

LOGIC.

By Joseph G. Anderson.

Whatever exists is a thing or being. The words "thing" and "being" are used convertibly. Things are of two kinds, Substances or beings by themselves, and Qualities or beings by accident or by or through another. "For *Being* (τὸ ὄν, *ens*) is primarily divided into *Being by itself* (*ens per se*) and *Being by accident* (*ens per accidens*)."*

Logic is the science of the Laws of Substances and Qualities *as* substances and qualities.

Every logical term names a substance or class of substances. A term may include in its signification all the individuals in a class (that is, the whole class), or a part of them only. When all the individuals are included the term is said to be universal, otherwise particular.

All substances outside of, or not belonging to, or included in, a class may be considered together as forming another class, which is the negative of the first. Hence results an axiomatic law:—Law I. Every class added to its negative equals or rather constitutes the class all substances. A negative class as well as a positive one may be considered all together or otherwise, and therefore negative terms may also be universal or particular in the same manner as positive terms.

There are, then, four classes of terms produced by this cross division of universal and particular, positive and negative terms, namely, the positive universal, the negative universal, the positive particular, and the negative particular.

Now let capital letters be used as universal terms and small letters as particular terms; let Roman letters be used as positive terms and Italic letters as negative terms. Thus, A as the positive universal term, the usual expression therefor being "All A"; *A* as the negative universal term, for which there is, perhaps, no exact equivalent commonly used, but which would mean the same as "All non-A," or "All except (or besides) *A*"; a as the positive particular, usually "Some A"; *a* as the negative particular, equivalent to "Some non-A," or a portion of what is outside the class A.

---

* Sir William Hamilton's Lectures on Logic, p. 141.

The particular terms a and *a* are indefinite in their meaning, being equivalent to any "some A," or any part of A, and are accordingly used when it is wished to signify an indefinite part of the class A. a′ and *a′* are used when it is desired to signify some definite part of the class A or the class *A*.

Discretive identity is the relation which two classes bear to each other when the same individuals which constitute one constitute the other also. The whole of one class may be discretively identical with the whole of another or with a part of another, or a part with a part. Now let a colon (:) placed between two terms be the sign of identity—indicate that the classes signified are discretively identical.

A proposition is a statement that two classes are discretively identical.

By the various combinations of the four classes of terms, sixteen propositions will result as follows:

(1) A:B,
(2) A:*B*,
(3) *A*:B,
(4) *A*:*B*,
(5) A:b,
(6) A:*b*,
(7) *A*:b,
(8) *A*:*b*,
(9) a:B,
(10) a:*B*,
(11) *a*:B,
(12) *a*:*B*,
(13) a:b,
(14) a:*b*,
(15) *a*:b,
(16) *a*:*b*.

These are all convertible. When A:B, B:A; when A:b, b:A, and so throughout. It will be observed that several of the propositions are substantially alike and that the number of propositions might thus be reduced to ten; but, for reasons that will appear hereafter, all are retained.

A number of inferences, commonly called immediate, arise from the first twelve propositions. Of these there are two series. The first arise in accordance with the following axiomatic law:—Law II. When a whole class is discretively identical with another whole class, or with part of another class, then any part of the first class will be discretively identical with a part of the second class.

In other words: What is true of each individual contained in a whole class, is also true of each individual contained in any part of that class.

Applying this law to the first twelve propositions, we have

From (1) A:B, a:b;
" (2) A:*B*, a:*b*;
" (3) *A*:B, *a*:b;
" (4) *A*:*B*, *a*:*b*;
" (5) A:b, a:b;
" (6) A:*b*, a:*b*;
From (7) *A*:b, *a*:b;
" (8) *A*:*b*, *a*:*b*;
" (9) a:B, a:b;
" (10) a:*B*, a:*b*;
" (11) *a*:B, *a*:b;
" (12) *a*:*B*, *a*:*b*.

While the particular term in the last eight examples does not change its form, there is in reality a lessening in the quantity of the term exactly corresponding to that in the other member of the proposition. So in the other four propositions while there may be an inference drawn in the same manner as in the first twelve, it would produce no change of form in the proposition. This can be made to appear as follows: in the proposition a:b, let us make both terms definite, $a':b'$; now let a'' be a part of a' and b'' be the corresponding part of b', then we have the inference from $a':b'$, $a'':b''$.

The second series of inferences arise in accordance with the following laws:

Law III. When a whole class is discretively identical with another whole class, the whole of the negative of the first class will be discretively identical with the whole of the negative of the second class.

Law IV. When a whole class is discretively identical with a part of another class, then a part of the negative of the first class is discretively identical with the whole of the negative of the second class.

These laws are demonstrated as follows:

Law III. When A:B, *A*:*B*.

Let Z be all substances:
Then A+*A*:Z, by Law I.;
but A:B,
therefore B+*A*:Z.
But B+*B*:Z,
therefore *A*:*B*.
A+*A*:B+*B*, by Law I.
Dropping A from one side, and its equivalent B from the other, we have *A*:*B*.

This reasoning may also be stated thus: If the classes A and B exactly coincide, then must their negatives also exactly coincide.

Law IV. When $\mathrm{A}:\mathrm{b}$, $a:B$.

$\mathrm{A}+A:\mathrm{Z}$;
$\mathrm{A}:\mathrm{b}$;
$\therefore\ \mathrm{b}+A:\mathrm{Z}$,
or $A:\mathrm{Z}-\mathrm{b}$.
Let $\mathrm{b}+\mathrm{b}':\mathrm{B}$,
then $\mathrm{b}+\mathrm{b}'+B:\mathrm{Z}$,
or $\mathrm{b}'+B:\mathrm{Z}-\mathrm{b}$,
whence $A:\mathrm{b}'+B$.
Let $\mathrm{b}+\mathrm{b}':\mathrm{B}$,
$\mathrm{A}+A:\mathrm{b}+\mathrm{b}'+B$,
$\therefore A:\mathrm{b}'+B$.
Dropping b′ from one side, and the corresponding portion of A from the other, we have $a:B$.

Applying law III. to the first four propositions, and law IV. to the next eight, we have

From (1) $\mathrm{A}:\mathrm{B}$, $A:B$;
" (2) $\mathrm{A}:B$, $A:\mathrm{B}$;
" (3) $A:\mathrm{B}$, $\mathrm{A}:B$;
" (4) $A:B$, $\mathrm{A}:\mathrm{B}$;
" (5) $\mathrm{A}:\mathrm{b}$, $a:B$;
" (6) $\mathrm{A}:b$, $a:\mathrm{B}$;
From (7) $A:\mathrm{b}$, $\mathrm{a}:B$;
" (8) $A:b$, $\mathrm{a}:\mathrm{B}$;
" (9) $\mathrm{a}:\mathrm{B}$, $A:b$;
" (10) $\mathrm{a}:B$, $A:\mathrm{b}$;
" (11) $a:\mathrm{B}$, $\mathrm{A}:b$;
" (12) $a:B$, $\mathrm{A}:\mathrm{b}$.

Neither of these laws apply to the last four propositions. The only inference from them is, first making both terms definite and letting $\mathrm{a}'+\mathrm{a}'':\mathrm{A}$ and $\mathrm{b}'+\mathrm{b}'':\mathrm{B}$, when $\mathrm{a}':\mathrm{b}'$, $A+a'':B+\mathrm{b}''$.

A Syllogism is an inference from two propositions having a common term which in the syllogism is called the middle term. The law of this inference is:

Law V. Classes discretively identical with the same class are discretively identical with each other. When $\mathrm{A}:\mathrm{B}$ and $\mathrm{B}:\mathrm{C}$, $\mathrm{A}:\mathrm{C}$.

By the various combinations of the sixteen propositions, two hundred and fifty-six pairs of premise-propositions will result as given in the following table, which also gives the conclusion, if any, to be derived from each :

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	A:B B:C A:C	A:B B:*C* A:*C*	A:B *B*:C *A*:C	A:B *B*:*C* *A*:*B*	A:B B:c A:c	A:B B:*c* A:*c*	A:B *B*:c *A*:c	A:B *B*:*c* *A*:*c*	A:B b:C a:C	A:B b:*C* a:*C*	A:B *b*:C *a*:C	A:B *b*:*C* *a*:*C*	A:B b:c a:c	A:B b:*c* a:*c*	A:B *b*:c *a*:c	A:B *b*:*c* *a*:*c*
2	A:*B* B:C *A*:C	A:*B* B:*C* *A*:*C*	A:*B* *B*:C A:C	A:*B* *B*:*C* A:*C*	A:*B* B:c *A*:c	A:*B* B:*c* *A*:*c*	A:*B* *B*:c A:c	A:*B* *B*:*c* A:*c*	A:*B* b:C *a*:C	A:*B* b:*C* a:*C*	A:*B* *b*:C a:C	A:*B* *b*:*C* a:*C*	A:*B* b:c *a*:c	A:*B* b:*c* *a*:*c*	A:*B* *b*:c a:c	A:*B* *b*:*c* a:*c*
3	*A*:B B:C *A*:C	*A*:B B:*C* *A*:*C*	*A*:B *B*:C A:C	*A*:B *B*:*C* A:*C*	*A*:B B:c *A*:c	*A*:B B:*c* *A*:*c*	*A*:B *B*:c A:c	*A*:B *B*:*c* A:*c*	*A*:B b:C *a*:C	*A*:B b:*C* *a*:*C*	*A*:B *b*:C a:C	*A*:B *b*:*C* a:*C*	*A*:B b:c *a*:c	*A*:B b:*c* *a*:*c*	*A*:B *b*:c a:c	*A*:B *b*:*c* a:*c*
4	*A*:*B* B:C A:C	*A*:*B* B:*C* A:*C*	*A*:*B* *B*:C *A*:C	*A*:*B* *B*:*C* *A*:*C*	*A*:*B* B:c A:c	*A*:*B* B:*c* A:*c*	*A*:*B* B:c *A*:c	*A*:*B* B:*c* *A*:*c*	*A*:B b:C a:C	*A*:*B* b:*C* a:*C*	*A*:*B* *b*:C *a*:C	*A*:B *b*:*C* *a*:*C*	*A*:*B* b:c a:c	*A*:B b:*c* a:*c*	*A*:*B* *b*:c *a*:c	*A*:B *b*:*c* *a*:*c*
5	A:b B:C A:c	A:b B:*C* A:*c*	A:b *B*:C A:*c*	A:b *B*:*C* A:c	A:b B:c A:c	A:b B:*c* A:*c*	A:b *B*:c *a*:c	A:b *B*:*c* *a*:*c*	A:b b:C *a*:*c*	A:b b:*C* *a*:c	A:b *b*:C A:*c*	A:b *b*:*C* A:c	A:b b:c *	A b b:*c* *	A:b *b*:c *a*:c	A:b *b*:*c* *a*:*c*
6	A:*b* B:C A:*c*	A:*b* B:*C* A:c	A:*b* *B*:C A:c	A:*b* *B*:*C* A:*c*	A:*b* B:c *a*:c	A:*b* B:*c* *a*:*c*	A:*b* *B*:c A:c	A:*b* *B*:*c* A:*c*	A:*b* b:C A:*c*	A:*b* b:*C* A:c	A:*b* *b*:C *a*:*c*	A:*b* *b*:*C* *a*:c	A:*b* b:c *a*:c	A:*b* b:*c* *a*:*c*	A:*b* *b*:c *	A:*b* *b*:*c* *
7	*A*:b B:C *A*:c	*A*:b B:*C* *A*:*c*	*A*:b *B*:C a:C	*A*:b *B*:*C* a:*C*	*A*:b B:c *A*:c	*A*:b B:*c* *A*:*c*	*A*:b *B*:c a:c	*A*:b *B*:*c* a:*c*	*A*:b b:C a:*c*	*A*:b b:*C* a:c	*A*:b *b*:C a:C	*A*:b *b*:*C* a:*C*	*A*:b b:c *	*A*:b b:*c* *	*A*:b *b*:c a:c	*A*:b *b*:*c* a:*c*
8	*A*:*b* B:C a:C	*A*:*b* B:*C* a:*C*	*A*:*b* *B*:C *A*:c	*A*:*b* *B*:*C* *A*:*c*	*A*:*b* B:c a:c	*A*:*b* B:*c* a:*c*	*A*:*b* *B*:c *A*:c	*A*:*b* *B*:*c* *A*:*c*	*A*:*b* b:C a:C	*A*:*b* b:*C* a:*C*	*A*:*b* *b*:C a:*c*	*A*:*b* *b*:*C* a:c	*A*:*b* b:*C* a:c	*A*:*b* b:*c* a:*c*	*A*:*b* *b*:c *	*A*:*b* *b*:*c* *
9	a:B B:C a:C	a:B B:*C* a:*C*	a:B *B*:C a:*C*	a:B *B*:*C* a:C	a:B B:c a:c	a:B B:*c* a:*c*	a:B *B*:c *A*:c	a:B *B*:*c* *A*:*c*	a:B b:C a:C	a:B b:*C* a:*C*	a:B *b*:C a:*c*	a:B *b*:*C* a:c	a:B b:c a:c	a:B b:*c* a:*c*	a:B *b*:c *	a:B *b*:*c* *
10	a:*B* B:C a:*C*	a:*B* B:*C* a:C	a:*B* *B*:C a:C	a:*B* *B*:*C* a:*C*	a:*B* B:c a:*C*	a:*B* B:*c* a:C	a:*B* *B*:c a:c	a:*B* *B*:*c* a:c	a:*B* b:C a:*c*	a:*B* b:*C* a:c	a:*B* *b*:C a:C	a:*B* *b*:*C* a:*C*	a:*B* b:c *	a:*B* b:*c* *	a:*B* *b*:c a:c	a:*B* *b*:*c* a:*c*
11	*a*:B B:C *a*:C	*a*:B B:*C* *a*:*C*	*a*:B *B*:C *a*:*C*	*a*:B *B*:*C* *a*:C	*a*:B B:c *a*:c	*a*:B B:*c* *a*:*c*	*a*:B *B*:c A:c	*a*:B *B*:*c* A:*c*	*a*:B b:C *a*:C	*a*:B b:*C* *a*:*C*	*a*:B *b*:C *a*:*c*	*a*:B *b*:*C* *a*:c	*a*:B b:c *a*:c	*a*:B b:*c* *a*:*c*	*a*:B *b*:c *	*a*:B *b*:*c* *
12	*a*:*B* B:C A:c	*a*:*B* B:*C* A:*c*	*a*:*B* *B*:C *a*:C	*a*:*B* *B*:*C* *a*:*C*	*a*:*B* B:c A:c	*a*:*B* B:*c* A:*c*	*a*:*B* *B*:c *a*:c	*a*:*B* *B*:*c* *a*:*c*	*a*:*B* b:C *a*:*c*	*a*:*B* b:*C* *a*:c	*a*:*B* *b*:C *a*:C	*a*:*B* *b*:*C* *a*:*C*	*a*:*B* b:c *	*a*:*B* b:*c* *	*a*:*B* *b*:c *a*:c	*a*:*B* *b*:*c* *a*:*c*
13	a:b B:C a:c	a:b B:*C* a:*c*	a:b *B*:C a:*c*	a:b *B*:*C* a:c	a:b B:c a:c	a:b B:*c* a:*c*	a:b *B*:c *	a:b *B*:*c* *	a.b b:C *	a:b b:*C* *	a:b *b*:C a:*c*	a:b *b*:*C* a:c	a:b b:c *	a:b b:*c* *	a:b *b*:c *	a:b *b*:*c* *
14	a:*b* B:C a:*c*	a:*b* B:*C* a:c	a:*b* *B*:C a:c	a:*b* *B*:*C* a:*c*	a:*b* B:c *	a:*b* B:*c* *	a:*b* *B*:c a:c	a:*b* *B*:*c* a:*c*	a:*b* b:C a:*c*	a:*b* b:*C* a:c	a:*b* *b*:C *	a:*b* *b*:*C* *	a:*b* b:c *	a:*b* b:*c* *	a:*b* *b*:c *	a:*b* *b*:*c* *
15	*a*:b B:C *a*:c	*a*:b B:*C* *a*:*c*	*a*:b *B*:C *a*:*c*	*a*:b *B*:*C* *a*:c	*a*:b B:c *a*:c	*a*:b B:*c* *a*:*c*	*a*:b *B*:c *	*a*:b *B*:*c* *	*a*:b b:C *	*a*:b b:*C* *	*a*:b *b*:C *a*:*c*	*a*:b *b*:*C* *a*:c	*a*:b b:c *	*a*:b b:*c* *	*a*:b *b*:c *	*a*:b *b*:*c* *
16	*a*:*b* B:C *a*:*c*	*a*:*b* B:*C* *a*:c	*a*:*b* *B*:C *a*:c	*a*:*b* *B*:*C* *a*:*c*	*a*:*b* B:c *	*a*:*b* B:*c* *	*a*:*b* *B*:c *a*:c	*a*:*b* *B*:*c* *a*:*c*	*a*:*b* b:C *a*:*c*	*a*:*b* b:*C* *a*:c	*a*:*b* *b*:C *	*a*:*b* *b*:*C* *	*a*:*b* b:c *	*a*:*b* b:*c* *	*a*:*b* *b*:c *	*a*:*b* *b*:*c* *

* No conclusion can be reached.

It will be observed that the same figure, that is, the same order of terms and propositions, is used throughout the table. This is done because we thus get every possible variation of the simple syllogism, the figure otherwise making not the slightest difference. If it were attempted to produce syllogisms in the other three possible figures, it would be found in effect to result in a simple repetition of the same syllogism. The conclusion is deduced from the two identities, and it makes no difference which proposition comes first, or, in each proposition, which term comes first.

In many of the cases in the table the conclusion is reached directly in accordance with law V. In others, however, it is necessary first to transform one or both the premises by laws II., III. and IV., or some of them, before a conclusion can be reached.

By examination of the table, it is found that a conclusion can be reached in every instance where two or more of the four terms contained in any two premise-propositions in the table are universal, and that too whatever be the variation of the terms as to quality.

When but one of the four terms is universal, a conclusion can be reached in all cases (and in those only) where the universal term is the middle term in one of the propositions and the middle term in the other proposition is of the same quality, that is, positive when the universal term is positive and negative when the universal term is negative, or where the propositions can be reduced to that form by the application of law III. or IV.

Keokuk, Iowa, Dec. 1, 1873.